

CLAIMS

1. A method of forming a coating film
which comprises applying an electrodeposition coating
5 [1] to an article to be coated and applying an electrodeposition
coating [2] thereon, followed by baking,
said electrodeposition coating [1] containing a
sulfonium group-containing resin and
giving a film thickness to a face B of not more than one
10 tenth of the film thickness of a face A when used in the
electrodeposition coating of a coating with a resin solid matter
of 20% by weight by a four sheet box method at 100 V and 40°C
for 120 seconds following a rise time of 5 seconds to provide
the face A with a 20 to 30 μm film thickness and
15 said electrodeposition coating [2] having a time point
at which the electric resistance value per unit volume of a
deposited coat increases in the process of electrodeposition
under a constant current condition.
- 20 2. The method of forming a coating film according to
Claim 1,
wherein the sulfonium group-containing resin in the
electrodeposition coating [1] is a resin (A) having at least
one functional group selected from the group consisting of
25 propargyl, carboxyl, epoxy, blocked isocyanato and hydroxyl
groups and/or an unsaturated double bond.
3. The method of forming a coating film according to
Claim 2,
30 wherein the resin (A) is a resin (A1) having a sulfonium
group, an aliphatic hydrocarbon group of 8 to 24 carbon atoms,
which optionally contain an unsaturated double bond within the
chain thereof, and a propargyl group.
- 35 4. The method of forming a coating film according to

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Claim 3,

wherein the resin (A1) has an epoxy resin skeleton.

5 5. The method of forming a coating film according to any one of Claims 1 and 2,

wherein the resin (A) is at least one resin (A2) selected from the group consisting of polyester resins, polyether resins, polycarbonate resins, polyurethane resins, polyolefin resins, acrylic resins and modifications of these.

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6. The method of forming a coating film according to Claim 5,

15 wherein the resin (A2) does not have a propargyl group but the electrodeposition coating [1] contains a curing agent (B) composed of a melamine or a blocked isocyanate.

7. The method of forming a coating film according to any one of Claims 2 to 4,

20 wherein the electrodeposition coating [1] contains a resin (C1) having a number average molecular weight of 1,000 to 30,000, and

25 said resin (C1) is at least one member selected from the group consisting of polyester resins, polyether resins, polycarbonate resins, polyurethane resins, polyolefin resins, acrylic resins, and modifications of these.

8. The method of forming a coating film according to any one of Claims 1 to 7,

30 wherein the electrodeposition coating [2] contains a resin (A3) having a sulfonium group, an aliphatic hydrocarbon group of 8 to 24 carbon atoms, which optionally contain an unsaturated double bond within the chain thereof, and a propargyl group.

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9. The method of forming a coating film according to

Claim 8,

wherein the resin (A3) has an epoxy resin skeleton.

10. The method of forming a coating film according to
5 any one of Claims 8 and 9,

wherein the electrodeposition coating [2] contains a
resin (C2) having a number average molecular weight of 1,000
to 30,000, and

said resin (C2) is at least one member selected from the
10 group consisting of polyester resins, polyether resins,
polycarbonate resins, polyurethane resins, polyolefin resins,
acrylic resins, and modifications of these.

11. The method of forming a coating film according to
15 any one of Claims 1 to 10,

wherein the electrodeposition coating [1] and the
electrodeposition coating [2] each contains a metal acetate
and/or an acetylacetonate complex as a catalyst, and

said metal is at least one member selected from the group
20 consisting of copper, cerium, aluminum, tin, manganese, zinc,
cobalt and nickel.

12. A coated article having the coating film formed by
the method of forming a coating film according to any one of
25 Claims 1 to 11.

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